CHAPTER VII
CONCLUSION

Tea is one of the most widely consumed beverages in the world and has been proved to exhibit various potential biological properties. In addition to these conventional teas, teas from different parts of native herbs are also the popular beverages in Thailand. The increased behavior in drinking herbal teas among the native consumers is due to the belief in health benefits. This study investigated antioxidant, anti–glycation (anti-AGEs formation), anti–obesity (lipase inhibitory activity) and anti–hypertension (ACE inhibitory activity) of commonly consumed fifteen Thai herbal teas in comparison to five conventional teas including green tea, white tea, oolong tea, black tea and pu-erh tea. The optimize extraction conditions of tea extracts were first investigated for antioxidant activities, which were found to correspond to different solvent systems. As results, teas extracted with 50% (v/v) aqueous ethanol exhibited the most effective antioxidant capacity, thus this extraction solvent was employed for further comparison of antioxidant with anti-AGEs formation, anti-lipase and anti-ACE activities. Additionally, tea infusions (the general condition for making tea) were also investigated regarding these similar properties.

The investigation on prevention of oxidative stress suggested that the antioxidant activity was associated with the quantity of phenolic compounds, in which green tea exhibited the highest activity followed by white tea, oolong tea, pu-erh tea and black tea, respectively. Thus, it could be suggested that the process of tea fermentation could cause a decrease in antioxidant activities. Besides, it was suggested that these antioxidant agents were associated to other biological properties including anti-glycation, anti-lipase and anti-ACE properties, in which similar trend of inhibitory activity of teas under different fermentation stages were observed.

Additionally, the comparison of these five conventional teas with fifteen Thai herbal teas suggested that the former provided generally higher biological properties than those of the later. Interestingly, stevia, Indian gooseberry and cat’s

whisker herbal teas exhibited comparable antioxidant activity to those of oolong tea. Likewise, stevia and cat's whisker herbal tea significantly inhibited the enzymatic reactions of lipase and ACE. Ginger herbal tea also possessed the highest lipase inhibitory activity among fifteen Thai herbal teas, while chrysanthemum and safflower herbal teas possessed comparable ACE inhibitory activity to those of conventional teas. It could be concluded that, in addition to conventional teas, ethanolic extract of Thai herbal teas, especially stevia and cat's whisker, may be useful for further development of dietary supplement and drug discovery with potential applications in prevention and treatment of oxidative stress, obesity and hypertension.

These similar biological functions of aqueous ethanol extracted teas were found to be significantly higher than those of tea infusions. Nevertheless, the results of tea infusions were consistent to the results of ethanolic extracted teas, in which green tea and white tea generally exhibited the highest inhibitory activities among conventional teas. The comparison of biological properties against oxidative stress, glycation formation, lipase enzyme and ACE activity of conventional tea and herbal tea infusions suggested that the former possessed higher inhibitory activities than those of the later in exception of stevia, Indian gooseberry and cat's whisker. These herbal tea infusions exhibited comparable antioxidant activities to those of green tea and white tea, while their anti-AGEs formations were even superior to those of conventional teas. However, only tea infusions from stevia and cat's whisker exhibited ACE inhibitory activity similar to those of green tea and white tea. Even though stevia and cat's whisker were also capable of inhibiting the reaction of lipase, these inhibitory activities were lower than those of conventional teas. This information can provide supportive evidence of the fundamental knowledge to promote the usage of conventional tea as well as stevia, cat's whisker and Indian gooseberry herbal teas as the excellent choices of healthy beverages for health conscious individual or patient under oxidative stress condition, obesity and hypertension.